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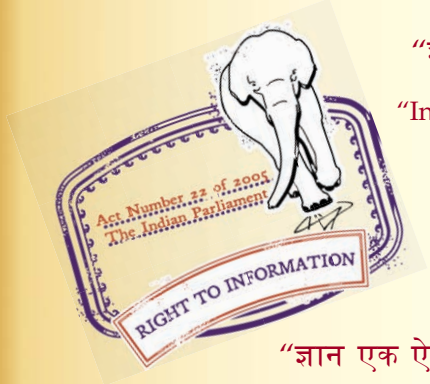
IS 6038 (1979): Dental Impression (Modelling) Compound [MHD 8: Dentistry]



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IS : 6038 - 1979
(Reaffirmed 2001)

Indian Standard

SPECIFICATION FOR DENTAL IMPRESSION (MODELLING) COMPOUND

(First Revision)

UDC 616·314-089·28-77

INDIAN STANDARDS INSTITUTION
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

Price Rs 7·00

December 1979

Indian Standard

SPECIFICATION FOR DENTAL IMPRESSION (MODELLING) COMPOUND

(First Revision)

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Indian Standard

SPECIFICATION FOR DENTAL IMPRESSION (MODELLING) COMPOUND

(*First Revision*)

0. FOREWORD

0.1 This Indian Standard (First Revision) was adopted by the Indian Standards Institution on 4 May 1979, after the draft finalized by the Dental Materials Sectional Committee had been approved by the Chemical Division Council.

0.2 Dental impression (modelling) compound is used in taking impressions and for forming trays to be used in the oral cavity. This compound is thermoplastic resinous material in the form of sticks or cakes, It can be softened to working consistency by immersion in hot water or by warming over flame.

0.3 This standard was first issued in 1970. It is being revised to include low heat impression materials which are used in the form of sticks. These are better known as tracing sticks. Tracing sticks are used in conjunction with customary impression compound. The latter alone will not, in all cases, give fine and clear impressions. In such cases tracing sticks are heated and applied to the periphery of the impression tray (individual tray) to develop the proper peripheral seal and give a fine and accurate impression of these areas.

0.3.1 Requirements for colour, odour (and flavour), irritation, working temperature range and working time range have also been included in the revision.

0.4 In the preparation of this standard, assistance has been derived from the following standards:

ASA-Z93·3-1962 Dental impression compound. American Standards Association.

u-1-00490 a(DSA-DM) 24 February 1969 Interim Federal Specification Impression Material (Modelling Compound), Dental. USA.

1. SCOPE

1.1 This standard prescribes the requirements and the methods of sampling and test for dental impression (modelling) compound.

2. TYPES

2.1 The material shall be of the following three types.

2.1.1 *Type* 1 — called 'impression compound', suitable for taking impressions in the oral cavity.

2.1.2 Type 2 — called 'tray compound', suitable for forming trays to be used in the oral cavity.

2.1.3 Type 3 — called 'tracing stick', or 'low heat compound', suitable for taking impressions in the oral cavity.

3. REQUIREMENTS

3.1 Description — The material shall be homogeneous throughout, capable of giving a smooth, glossy surface after flaming and shall also give firm and smooth margins after trimming with a knife at room temperature.

3.2 **Material** — The material shall essentially be a composition of resins and fillers with necessary additives, such as plasticizers and colouring agents.

3.3 Forms

3.3.1 The material of Type I shall be furnished in cake or stick form. and shall be uniform and suitable for taking impression in the oral cavity.

3.3.2 The material of Type 2 shall be furnished in cake form and shall be uniform and suitable for forming trays to be used in the oral cavity.

3.3.3 The material of Type 3 shall be furnished in stick form and shall be uniform and suitable for use in corrected impression techniques.

3.4 **Colour** — **The** material of Type 1 shall be red; Type 2 black; and, Type 3 green in colour.

3.5 Odour **and Flavour** — **The** material shall have no unpleasant odour or flavour.

3.6 Irritation — The material shall not irritate oral tissues and shall not contain poisonous ingredients in such concentration as may be harmful to human beings when used as directed.

3.7 **Working Temperature Range** — The material shall soften to a workable consistency within the temperature range specified below when tested as prescribed in A-l:

Type 1	53'5 to 56·5°C
Type 2	55'0 to 58·0°C
Type 3	50'0 to 52'2°C

3.8 **Working Time Range** — The working time range of the material shall be from 50 to 80 seconds when tested as prescribed in A-l.

3.9 **Flow** — The percent of flow shall be as given in Table 1 when tested as prescribed in A-2.

TABLE 1 FLOW TEST

TEMPERATURE °C	FLOW, PERCENT		
	Type 1	Type 2	Type 3
(1)	(2)	(3)	(4)
37.0	6·0 *Max*	2·0 *Max*	6·0 *Max*
45.0	88·0 *Min*	70.0 to 85·0	88.0 *Min*

3.10 Impression Test — The material of Type 1 and Type 3 shall accurately record the complete surface detail of the test block (*see* Fig. 3) at 45°C when tested as prescribed in A-3.

4. PACKING AND MARKING

4.1 **Packing** — Each cake or each stick shall be separated with, or wrapped in, silicon paper and packaged in a carton of appropriate size. Each carton shall be securely closed to prevent spillage of contents under normal handling.

4.2 **Marking** — Each carton shall bear legibly and indelibly the following information:

a) Name and type of the material;

b) Name of the manufacturer and his recognized trade-mark, if any;

c) Gross and net mass;

d) Number of cakes/sticks in each carton;

e) Size of the cakes/stick;

f) Batch number; and

g) Date of manufacture.

4.2.1 *Manufacturer's Instructions* — The manufacturer shall supply with each package instructions for use of the material. These instructions shall include the method of softening, working temperature and a curve or data showing the shrinkage of the compound from 40 to 20°C.

4.2.2 The cartons may also be marked with the IS1 Certification Mark.

NOTE — The use of the ISI Certification Mark is governed by the provisions of the Indian Standards Institution (Certification Marks) Act and the Rules and Regulations made thereunder. The ISI Mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well-defined system of inspection, testing and quality control which is devised and supervised by ISI and operated by the producer. ISI marked products arc also continuously checked by ISI for conformity to that standard as a further safeguard. Details of conditions under which a licencc for the use of the ISI Certification Mark may be granted to manufacturers or processors, may be obtained from the Indian Standards Institution.

5. SAMPLING

5.1 Representative samples of the material shall bedrawn as prescribed in Appendix B or as agreed to between the purchaser and the supplier.

6. TEST METHODS

6.1 Tests shall be conducted according to methods prescribed in Appendix A.

APPENDIX A

(Clause 6.1)

METHODS OF TEST

A-l. WORKING RANGE TEST

A-l.1 Apparatus

A-1.1.1 *Water-Bath*

A-l.2 Procedure — Adjust and maintain the water-bath at the desired working temperature range (see 3.7). Take 30 ± 2 g of the material, place in the water-bath and warm for 15 minutes. Remove the warmed material from the water-bath and work (knead) in wet hand for 15 seconds. Return the material to water-bath and condition for an additional 5 minutes. Remove the material from the water-bath again and work (knead) in wet hand until the material loses plasticity or proper working consistency and can no longer be moulded by finger pressure. The total time elapsed from final removal from the water-bath to the loss of plasticity shall be termed as working time.

A-2. FLOW TEST

A-2.1 Apparatus,

A-2.1.1 *Flow Testing Machine* — The flow testing machine (see Fig. 1) consists of a weight A, a non-conducting shaft *B* and a brass platen C. The total weight in air of the three components is 2 kg. The weight *A* shall be separated from the platen C on the shaft *B* by a minimum distance of 75 mm. The shaft shall be hard rubber or a similar poor thermal conductor to avoid loss of heat due to conduction. The diameter of the brass platen which touches the test specimen shall be not less than 50 mm. The thickness of the platen shall not exceed 6'5 mm.

A-2.1.2 *Micrometer Caliper* — capable of measuring to 0'001 mm.

A-2.1.3 *Water-Bath*

A-2.2 Preparation of Test Specimen — Break a sufficient number of cakes or sticks of the material into pieces and place in an iron crucible of 60 ml capacity. Place the crucible 130 mm below a 250 W infrared lamp bulb. Heat the stirred compound to a temperature of 75 ± 5°C

(checked with a thermometer) until melted throughout and then pour into a mould (*see* Fig. 2). The mould shall be a flat, stainless steel metal plate 6'0 mm thick, containing four holes of 10'0 mm in diameter. Preheat the mould to a temperature of 55 ± 5°C and place on a smooth glass slab (150 mm long, 75 mm wide, 20 mm thick.) preheated to the same temperature. After the mould has been overfilled with the material, place a smooth flat tin-foil-covered glass plate preheated to 55 ± 5°C on top of the mould. Apply a load of 9 kg to the top of the tin-foiled glass plate for ten minutes. Then place the mould in water at a temperature of 10°C for ten minutes. Remove the upper tin-foiled plate and trim away the excess material. This can be accomplished by using a metal scraper with the top surface of the mould as a guide. Then remove the mould from the glass slab by gently tapping the side of the mould. Remove the specimens from the mould by chilling in water for ten minutes at 10°C, and store at room temperature (27·0 ± 2'0°C) for 24 hours before testing.

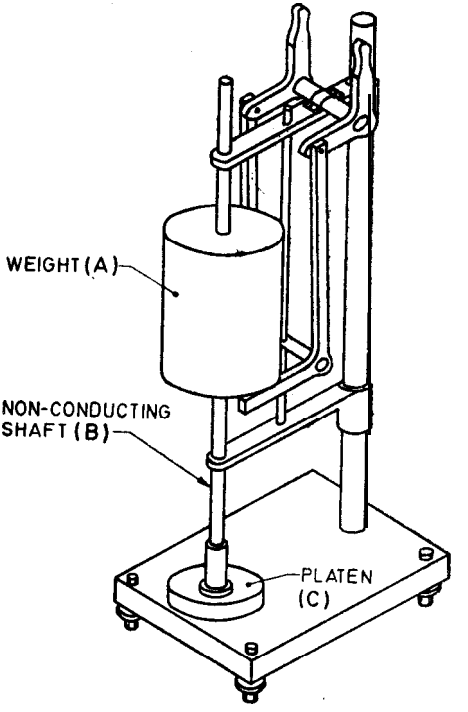


FIG. 1 FLOW TESTING MACHINE

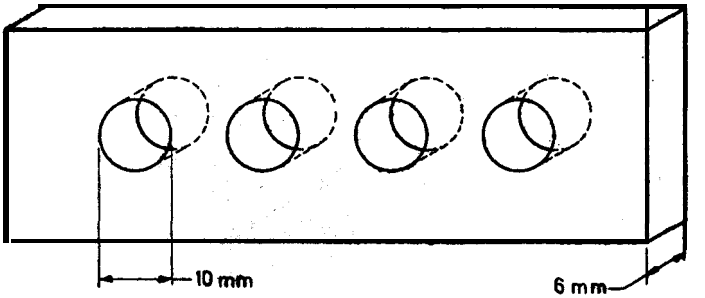


FIG. 2 MOULD FOR FORMING FLOW SPECIMENS

A-2.3 Procedure — Measure the original length of the specimen using a metric micrometer caliper. Make four measurements around the circumference and one measurement on the centre of the *specimen*. Record the measurements to the nearest 0'005 mm. Place the specimen and flow testing instrument (see Fig. 1) in a water-bath and hold at the testing temperature for 20 minutes prior to testing. Control the temperature in the bath to within ± 0'1°C of the required temperature (use a calibrated thermometer for determining the temperature). Place a thin sheet of waterproof cellophane between the instrument and each end of the specimen. The bottom of the specimen shall be 50 mm below the surface of the water in the bath. Apply a constant axial load of 2 kg to the specimen for. ten minutes, after which remove the specimen and cool in air to room temperature. Strip off the cellophane and determine the final length as in the case of the original length.

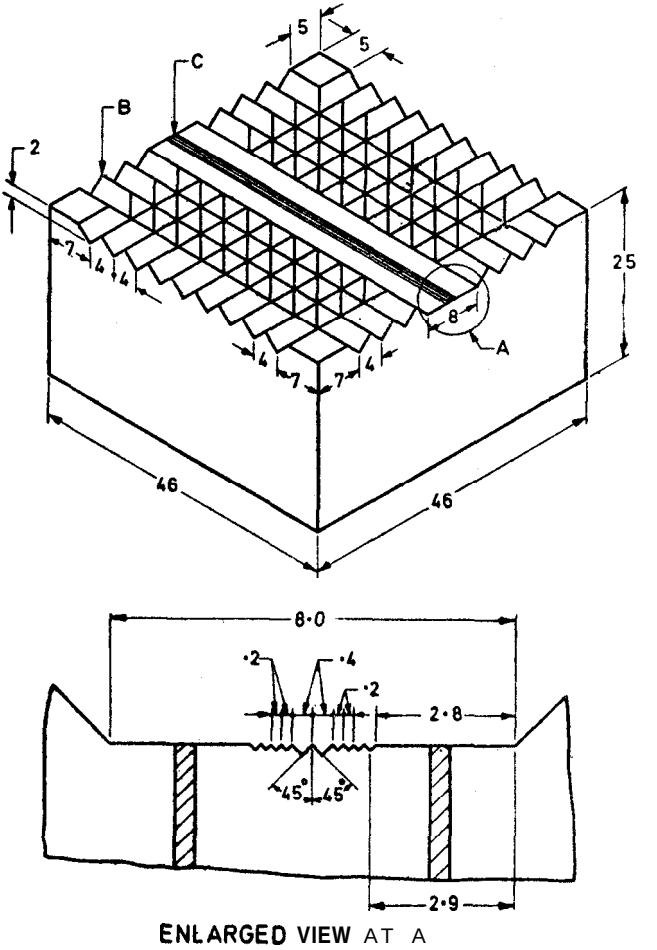
A-2.4 Calculation — Calculate flow as evidenced by the change in length as percentage of the original length. Report the mean of the values for two specimens to the nearest 0'1 percent.

A-3. IMPRESSION TEST

A-3.1 Apparatus

A-3.1.1 *Test Block* — *See* Fig. 3.

A-3.1.2 *Brass Weight* — weighing 1 000 ± 5 g in air, and having a base 50 mm.



NOTE—All grooves, 90" included angle, sides at 45° to surface of block.

All dimensions in millimetres.

FIG. 3 BLOCK FOR IMPRESSION TEST

A-3.1.3 *Water-Bath*

A-3.2 **Preparation of Test Specimens** — The specimen shall be a disc 40 mm in diameter and between 4 mm and 7 mm in thickness. Warm

the cake of compound in water and cut the disc. If the cake is thinner than 4 mm, flame and press together two cakes before cutting the disc.

A-3.3 Procedure — Adjust a water-bath to 45·0 ± 0'1°C. Place in the bath a flat plate (to support the specimens while it is coming to the required temperature), the test block (see Fig. 3) and the brass weight, and allow to come to the temperature of the bath. Keep the water level in the bath 30 ± 5 mm above the top surface of the test block. Then place the specimen, in the water-bath, on the flat plate. Twenty minutes later, centre the specimen on the test block, place a sheet of waterproof cellophane over the specimen, and place the weight on the specimen. Ten minutes later, remove the weight, take out the test block and specimen from the bath and chill at a temperature of 10°C. Remove the specimen from the test block.

A-3.3.1 Examine the impression on the-specimen to determine if the ridges corresponding to the large cross grooves (*B* in Fig. 3) of the test block are sharp, and the ridges corresponding to the fine grooves (*C* in Fig. 3) are complete and visible to the unaided eye for at least 3 mm of their length.

APPENDIX B

(Clause 5.1)

SAMPLING

B-l. GENERAL REQUIREMENTS OF SAMPLING

B-1.0 In drawing, preparing, storing and handling test samples, the precautions and directions given in B-l.1 to B-l.5 shall be observed.

B-l.1 Samples shall not be taken in an exposed place.

B-l.2 Sampling instrument shall be clean and dry.

B-l.3 Precautions shall be taken to protect the samples, the material being sampled, the sampling instrument and the containers for samples from adventitious contamination.

B-l.4 The sample shall be placed in clean, dry, air-tight glass or other suitable containers.

B-l.5 Each sample container shall be sealed air-tight with a suitable stopper after filling, and marked with full details' of sampling, the date of sampling and the year of manufacture of the material.

B-2. SCALE OF SAMPLING

B-2.1 Lot — All the containers in a single consignment of the material drawn from a single batch of manufacture shall constitute a lot. If a consignment is declared or known to consist of different batches of manufacture, the containers belonging to the same batch shall be grouped together and each such group shall constitute a separate lot.

B-2.1.1 Samples shall be tested from each lot for ascertaining conformity of the material to the requirements of the specification.

B-2.2 The number of containers (n) to be selected from the lot shall depend on the size of the lot (N) and shall be as given in Table 2.

TABLE 2 NUMBER OF CONTAINERS TO BE SELECTED FOR SAMPLING

LOT SIZE	No. OF CONTAINERS TO BE SELECTED
N	n
(1)	(2)
3 to 50	3
51 to 200	4
201 to 400	
401 to 650	a
651 to 1 000	7
1 001 and above	8

B-3. TEST SAMPLES AND REFEREE SAMPLE

B-3.1 Preparation of Test Samples

B-3.1.1 Draw with an appropriate sampling instrument a small portion of the material from different parts of each container selected (see Table 2). The total quantity of the material drawn from each container shall be sufficient to conduct the tests for all the characteristics given under 3 and shall be not less than 250 g.

B-3.1.2 Thoroughly mix all portions of the material drawn from the same container. Out of these portions, equal quantities shall be taken from each selected container and shall be well mixed up together so as to form a composite sample weighing not less than 0'5 kg. This composite sample shall be divided into three equal parts, one for the purchaser, another for the supplier and the third for the referee.

B-3.2 Referee Sample — The referee sample shall consist of a composite sample markedfor this purpose and shall bear the seals of the purchaser and- the supplier. It shall be kept at a place agreed to between the purchaser and the supplier and shall be used in case of dispute between the two.

B-4. NUMBER OF TESTS

B-4.1 Tests for all the characteristics given in 3 shall be conducted on the composite sample.

B-5. CRITERIA FOR CONFORMITY

B-5.1 A lot shall be declared as conforming to this specification if the composite sample satisfies the requirements for each of the characteristics given in 3. If the requirements for any of the characteristics are not met, the lot shall be declared to have not satisfied the requirements of the specification.

INDIAN STANDARDS
ON
DENTAL MATERIALS AND ALLIED PRODUCTS

Dental Materials

IS:

6035-1970 Zinc phosphate dental cement
6036-1970 Alginate dental impression material
6037-1970 Zinc oxide-eugenol dental impression paste
6038-1979 Dental impression (modelling) compound (*first revision*)
6039-1970 Zinc oxide-eugenol dental cement
6043-1970 Copper phosphate-zinc phosphate dental cement
6555-1972 Dental laboratory plaster
6556-1972 Dental impression plaster
6884-1973 Dental silicate cement
6887-1973 Denture base polymer
6888-1973 Dental inlay casting wax
7348 (Part III)-1975 Glossary of terms relating to dentistry : Part III Dental materials
7425-1974 Dental casting investment for gold alloys
7966-1976 Dental modelling wax
8019-1976 Dental artificial stone
8020-1976 Baseplate, dental
8021-1975 Dental sticky wax
8022-1976 Acrylic resin teeth
8571-1977 Dental porcelain
8850-1978 Guide for the use of dental materials
8864-1978 Autopolymerizing (acrylic) resins for dental use
8815-1978 Tooth designation for dental purposes (two digit system)

Dental Alloys and Amalgams

IS:

3571-1966 Dental gold solders
3578-1966 Dental gold alloy wire
3610-1966 Dental gold foil
4704-1968 Silver-tin dental amalgam alloy
4705-1968 Dental mercury
4799-1968 Dental casting gold alloys
5954-1970 Dental white gold alloys
6889-1973 Method for chemical analysis of silver-tin dental amslgam alloy
6890 (Part I)-1973 Method for chemical analysis of dental gold alloys : Part I Determination of gold, silver, copper, palladium and platinum
6890 (Part 11)-1975 Method for chemical analysis of dental gold alloys : Part II Determination of nickel and zinc
7225-1974 Dental cobalt chromium casting alloys

INTERNATIONAL SYSTEM OF UNITS (SI UNITS)

Base Units

Quantity	Unit	Symbol
Length	metre	m
Mass	kilogram	kg
Time	second	
Electric current	ampere	A
Thermodynamic temperature	kelvin	K
Luminous intensity	candela	cd
Amount of substance	mole	mol

Supplementary Units

Quantity	Unit	Symbol
Plane angle	radian	rad
Solid angle	steradian	sr

Derived Units

Quantity	Unit	Symbol	Definition
Force	newton	N	$1\ N = 1\ kg.m/s^2$
Energy	joule	J	$1\ J = 1\ N.m$
Power	watt	W	$1\ W = 1\ J/s$
Flux	weber	Wb	$1\ Wb = 1\ V.s$
Flux density	tesla	T	$1\ T = 1\ Wb/m^2$
Frequency	hertz	Hz	$1\ Hz = 1\ c/s\ (s^{-1})$
Electric conductance	siemens	S	$1\ S = 1\ A/V$
Electromotive force	volt	V	$1\ V = 1\ W/A$
Pressure, stress	pascal	Pa	$1\ Pa = 1\ N/m^2$

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